Charles Borbridge

Personal Address / Ex. 6

My background: family members have been commercially fishing Bristol Bay since the 1940's. All of my family consumes fish caught and processed during the summer salmon fishery.

Position: I support the EPA's continuing study and acceptance of public comment on the potential impact of large scale mining on Bristol Bay. I would support the EPA using its authority to deny permits for large scale mines in the Bristol Bay watershed such as Pebble.

Thanks for continuing to study and accept comments on the potential impacts of large scale mines on Bristol Bay.

The following are some of the areas addressed in the draft study that I support:

The effects of mining infrastructure such as roads and pipelines.

Acknowledging the impact of large scale mining even if no failures or disasters occur.

Acknowledging the effects of the passage of time.

Please address the following areas in future studies:

Please include the recent U of Alaska study on the annual benefits from the Bristol Bay fishery. This includes both the benefits from activities that occur within the Bristol Bay region and activities that occur outside the region but nevertheless are connected to the Bristol Bay fishery. The annual value of these activities is placed at 1.5 billion dollars.

Please include the latest studies on ground water movement in the Bristol Bay watershed and the impact of pollutants that contaminate the ground water. If one of the features of Bristol Bay is a high degree of ground water movement that benefits the region by transporting nutrients would that same system spread contaminants from a mining operation.

Time has a great effect on large scale projects whose impacts are permanent. Not only must the physical structures withstand the effects of time but so also must the human organizations managing the mine. Mine proponents have acknowledged that the storage of toxic tailings represent a permanent hazard. This is self evident from their acknowledgement of the need for on-site personnel to permanently monitor tailings storage and intervene as needed. Even for the long term storage to "work" on a theoretical basis and avoid the inevitable ravages of time, the integrity of the tailings storage then depends on the existence, commitment, and capability of the human organization responsible for the post production life of the mine.

In the history of the human race and the history of this planet, no human organization has lasted forever. EPA should state this rather obvious fact. If the human organization on which proper managing depends cannot last, the integrity of the post production mine is at risk. EPA should state that conclusion. As many have stated regards the passage of time, financial systems have crashed...many times, governments have fallen...many times, and civilizations have risen and disappeared. Going far enough back in time, historical records don't exist. It is silly to believe that some mining company will outlast all others eons into the future

This does not address the laundry list of circumstances that can impact the commitment, the capability, or even the existence of a human organization charged with managing the mine far into future. Many of these were mentioned in the draft study. Among others these include: change of management, change of ownership, change of environmental requirements, legal suits, bad business decisions, changing market demand, change in political national leadership, change in technology, any financial pressures to increase profit by lowering cost. This list could continue almost without end.

I was glad to see multiple mining sizes for the Pebble Project to address the impact of mining activity. . It would also be useful to use multiple mining district sizes to address the impact of a potential multi-mine future in the Bristol Bay watershed. So, in addition to mine 1, 2, and 3 we might also see mining district 4, 5, and 6. Most are in agreement that a Pebble mine would mean additional mines in the future. It would useful to estimate the impact of a multi-mine future on Bristol Bay.

I would like more information on the effects of pollutants such as heavy metals and mining related chemicals. I appreciate the information already provided on the effects of copper and various mining activity on the mortality of salmon, but more is needed. In areas with salmon producing waters outside of Alaska industrialization has a wide impact. One of the prominent impacts is a measurable increase in presence of pollutants in the salmon such as mercury. There are two main impacts of mining related pollutants: the impacts from fewer fish and the impacts from the surviving fish having increased levels of pollutants. Both impacts need to be addressed

Both fewer fish and tainted fish will impact the health of the local population of Bristol Bay. Fewer fish means less healthy salmon in the diet of the local population. This has been mentioned in the draft study, but more information is needed on the impact of fish with various higher levels of pollutants entering the diet of the local people. In areas outside Alaska with salmon that have experienced mining and industrialization, residents are often warned to limit their consumption of salmon. In Bristol Bay, some residents eat salmon every day. It is likely that whatever pollutants become present in the salmon as a result of large scale mining would also enter the diet of those that eat the fish on a regular basis. This needs to be addressed. Providing a warning would likely have little if any impact since consumption of salmon is so much a part of living in Bristol Bay and the salmon people catch and consume will not have labels on their bodies that indicate their origin or the levels of pollutants. If salmon from some river systems are polluted, those pollutants will enter the diet of the local people.

Both fewer fish and tainted fish will also impact commercial enterprises that depend not only a high numerical return of salmon but also fish that are healthy and healthy to eat. The impact of lower

returns has been mentioned in the draft study. Salmon sales and salmon prices have benefitted from a reputation of well managed, sustainable fisheries and a reputation of producing fish that are very healthy to consume. If two of the main rivers in the premier salmon fishery not only produce fewer fish due to mining activity but fish that are considered less healthy, this would certainly harm the demand for Bristol Bay salmon. This would not only hurt the prices for fish from Bristol Bay but potentially the prices for "Alaska Seafood."

Given the potential impact in the future, more comment is needed on the seismic activity on the proposed mining area. Very minimal study was performed by the Pebble group. More study is needed on the seismic activity in the proposed mining district and the effects of seismic events on earthen dams that are built with mining tailings. This is especially critical when people sometimes describe the effect of a significant earthquake as "liquefying" the ground. What effect would a significant earthquake have on what is essentially a massive earthen structure.

More information could be provided on predicted failure rates of earthen dams. This should be beyond the predicted failure rates of standard or select engineered dams. We don't know what level of engineering will occur until the dam is built. The estimates of the durability of the dams should more specifically include estimates of longevity of earthen dams located in an earthquake zone. There is less certainty in engineering an earthen dam built with mine tailings as opposed to other more uniform earthen dam. As acknowledge in the study, there is more difficulty in predicting the performance of any structure the longer it must last. The requirement of these dams is that they last forever.

More needs to be learned about the importance of genetic diversity of salmon stocks. A healthy diversity of salmon producing streams is important to a salmon producing river A healthy diversity of salmon producing rivers is important to a salmon producing fishery such as Bristol Bay. Does an impact on an area of salmon producing streams impact the overall health of a fishery beyond a specific number of salmon lost. If it can take 1,000's of years of natural selection and adaptation to produce the salmon stocks in various streams, how much is lost by possibly losing them in a few years. What may be lost even if there is an attempt to somehow "replace" the numbers lost with perhaps greater numbers elsewhere?

Although, this is mentioned in the draft study, EPA needs to more fully emphasize the impact of the passage of time. The post production mine is supposed to last forever. When dealing with time spans such as "forever," the unforgiving reality of the passage of time acts as a crushing weight that transforms potential problems into likely problems and then into inevitable problems. This includes everything from "smaller" problems to catastrophic failures. EPA needs to be more forceful regarding the impact of such long time spans on the post production mines in the Bristol Bay area.

Regards conclusions, EPA must be more direct in the inevitable conclusion regards large scale mining in the Bristol Bay watershed. In the long term, a thriving salmon fishery cannot coexist with large scale mining. EPA needs to save Bristol Bay. EPA needs to pull the mining permits.